

What is claimed is:

1. A laser array imaging lens consisting of:

a single lens component with or without a stop positioned on the image side of the single lens component;

at least one surface of the single lens component is both anamorphic and aspheric; and
a diffractive optical element that is either superimposed on said at least one surface or is formed on another surface of the single lens component, said diffractive optical element being defined by a phase function.

2. The laser array imaging lens according to claim 1, wherein a stop is positioned on the image side of the single lens component at a specified distance.

3. In combination:

a laser array light source; and

a laser array imaging lens which receives light from the laser array light source, the laser array imaging lens consisting of a single lens component with or without a stop positioned on the image side of the single lens component, with at least one surface of the single lens component being both anamorphic and aspheric;
wherein the following condition is satisfied

$$0.5 < L / (D_2 \cdot (1 - 1/M)) < 2.0$$

where

L is the distance from the laser array light source to the light-source side of the laser array imaging lens;

D_2 is the distance along the optical axis from the image-side surface of the laser array imaging lens to the position where the centers of the beams from the laser elements of the laser array light source intersect the optical axis after being refracted by the laser array imaging lens; and

M is the image magnification.

1 4. The combination according to claim 3, wherein a stop is positioned on the image side of the
2 single lens component at a specified distance.

1 5. An image-forming device that includes the laser array imaging lens according to claim 1, and
2 further comprises:

3 a laser array light source made by arraying multiple light emitting elements in one or
4 more rows;

5 means for independently modulating the individual light emitting elements of the laser
6 array light source, based on a prescribed signal; and

7 means for relatively moving a surface to be scanned, that is positioned substantially at an
8 image surface of the laser array imaging lens, in a sub-scanning direction that is roughly
9 perpendicular to the direction of the image dots that form one or more rows at the image surface.

1 6. An image-forming device that includes the laser array imaging lens according to claim 2, and
2 further comprises:

3 a laser array light source made by arraying multiple light emitting elements in one or
4 more rows;

5 means for independently modulating the individual light emitting elements of the laser
6 array light source, based on a prescribed signal; and

7 means for relatively moving a surface to be scanned and that is positioned substantially at
8 the image surface of the laser array imaging lens, in a sub-scanning direction that is roughly
9 perpendicular to the direction of the imaged dots that form one or more rows at the image
10 surface.

1 7. An image-forming device that includes the combination according to claim 3, and further
2 comprises:

3 means for independently modulating the individual light emitting elements of the laser

4 array light source, based on a prescribed signal; and

5 means for relatively moving a surface to be scanned and that is positioned substantially at
6 the image surface of the laser array imaging lens, in a sub-scanning direction that is roughly
7 perpendicular to the direction of the imaged dots that form one or more rows at the image
8 surface.

1 8. An image-forming device that includes the combination according to claim 4, and further
2 comprises:

3 means for independently modulating the individual light emitting elements of the laser
4 array light source, based on a prescribed signal; and

5 means for relatively moving a surface to be scanned and that is positioned substantially at
6 the image surface of the laser array imaging lens, in a sub-scanning direction that is roughly
7 perpendicular to the direction of the imaged dots that form one or more rows at the image
8 surface.

1 9. The laser array imaging lens according to claim 1, wherein the single lens component consists
2 of a single lens element.

1 10. The laser array imaging lens according to claim 2, wherein the single lens component
2 consists of a single lens element.

1 11. The combination according to claim 3, wherein the single lens component consists of a
2 single lens element.

1 12. The combination according to claim 4, wherein the single lens component consists of a
2 single lens element.

1 13. The image-forming device according to claim 5, wherein the single lens component consists

2 of a single lens element.

1 14. The image-forming device according to claim 6, wherein the single lens component consists
2 of a single lens element.

1 15. The image-forming device according to claim 7, wherein the single lens component consists
2 of a single lens element.

1 16. The image-forming device according to claim 8, wherein the single lens component consists
2 of a single lens element.

1 17. The laser array imaging lens according to claim 2, wherein the stop is positioned so that the
2 laser array imaging lens is substantially telecentric on the light-source side.

1 18. The combination according to claim 4, wherein the stop is positioned so that the laser array
2 imaging lens is substantially telecentric on the light-source side.

1 19. The image-forming device according to claim 6, wherein the stop is positioned so that the
2 laser array imaging lens is substantially telecentric on the light-source side.

1 20. The image-forming device according to claim 8, wherein the stop is positioned so that the
2 laser array imaging lens is substantially telecentric on the light-source side.